A METHOD OF MANAGING QUALITY OF SERVICE IN A MOBILE RADIO
SYSTEM

The present invention relates generally to mobile
radio systems.

5   The present invention is applicable to third
generation mobile radio systems, for example, and in
particular to mobile radio systems of the Universal
Mobile Telecommunications System (UMTS) type.

Mobile radio systems are generally covered by
10   standards and the corresponding standards published by
the corresponding standards bodies may be consulted for
more information.

Figure 1 outlines the general architecture of mobile
radio systems, essentially comprising:
15   - a radio access network (RAN) 1, and
- a core network (CN) 4.

The radio access network comprises network elements
such as base stations 2 and base station controllers 3
and communicates with mobile terminals 5 via an interface
20   6 and with the core network 4 via an interface 7. The
core network 4 communicates with external networks (not
specifically shown). Within the radio access network,
the base stations communicate with the base station
controllers via an interface 8.

25   In a UMTS type system, the radio access network is
called the UMTS terrestrial radio access network (UTRAN),
a base station is called a Node B, a base station
controller is called a radio network controller (RNC),
and a mobile terminal is called a user equipment (UE).
30   The interface 6 is called the Uu interface, the interface
7 is called the Iu interface, the interface 8 is called
the Iub interface, and an interface 9 between radio
network controllers is called the Iur interface. The
interface 6 is also called the radio interface and the
35   interfaces 7, 8 and 9 are also called terrestrial
interfaces.

The radio network controller that controls a given

Node B is called the controlling radio network controller (CRNC) and has a load control and radio resource allocation role for each Node B that it controls. Thus Figure 2 shows a CRNC controlling a set of Nodes B and

5   the cells (not specifically shown) that are covered by those Nodes B.

For a given call relating to a given user equipment, there is a serving radio network controller (SRNC) having a control role for the call concerned. A Node B

10   connected to the user equipment but not controlled by the SRNC communicates with the SRNC via the radio network controller that controls it, also known as the drift RNC (DRNC), via the Iur interface. This situation arises in macrodiversity transmission, also known as soft handover,

15   for example (although not exclusively). Thus Figure 3 shows an SRNC controlling a user equipment and communicating with the core network via the interface Iu, and a DRNC controlling the user equipment for radio links set up for cells controlled by that DRNC (these cells are

20   not specifically shown).

The above systems must generally be able to support traffic whose quality of service (QoS) requirements may differ greatly. The quality of service architecture in a system such as the UMTS, for example, is defined in the

25   Technical Specification 3GPP TS 23.107 published by the 3rd Generation Partnership Project (3GPP). This quality of service architecture is based on support services characterized by quality of service attributes. There are various support services, for example radio access

30   bearer (RAB) services, radio bearer (RB) services and Iu bearer services. There are various quality of service attributes, for example traffic class, maximum bit rate, guaranteed bit rate, transfer delay, traffic handling priority, etc. There are four traffic classes, namely

35   conversational application, streaming application, interactive application and background application traffic classes. The quality of service attributes other

than the traffic class may also be different for
different types of service in the same traffic class; for
example, for the conversational traffic class, the
transfer delay for a telephone service is less than the
5   transfer delay for a videophone service, which in turn is
less than the transfer delay for a web browsing service,
for example, for the interactive traffic class, for
example. The transfer delay is generally specified only
for the conversational and streaming traffic classes and
10   the traffic handling priority is generally specified only
for the interactive traffic class.

    A model has been defined for the terrestrial
interface communications protocols in which a distinction
is drawn between a radio network layer corresponding to
15   functions related to radio access, which are independent
of the technology used for transport over the terrestrial
interfaces, and a transport network layer corresponding
to functions related to transport, which depend on the
technology used for transport over the terrestrial
20   interfaces. As a general rule, two types of data may be
communicated using these protocols, namely data
corresponding to traffic sent or received by a user
equipment (also known as user data), and data
corresponding to signaling, necessary for the operation
25   of the system. There are two types of signaling, namely
signaling related to the radio network layer and
signaling related to the transport network layer.

    The signaling relating to the radio network layer
corresponds to the following protocols, for example,
30   which are also known as application protocols:

       - for the Iu interface, the Radio Network
         Application Part (RANAP) protocol, defined for
         example in the Technical Specification 3GPP TS
         25.413 published by the 3GPP,
35   - for the Iub interface, the Node B Application Part
         (NBAP) protocol, defined for example in the
         Technical Specification 3GPP TS 25.433 published

by the 3GPP, and

- for the Iur interface, the Radio Network Subsystem
  Application Part (RNSAP) protocol, defined for
  example in the Technical Specification 3GPP TS
5   25.423 published by the 3GPP.

The RANAP protocol includes signaling relating to
radio access bearer (RAB) set-up. The NBAP protocol
includes signaling relating to radio link set-up for
cells controlled by the SRNC. The RNSAP protocol
10   includes signaling relating to radio link set-up for
cells controlled by the DRNC.

Quality of service management in the above kind of
system generally comprises quality of service management
linked to radio access, which is independent of the
15   technology used for transport over the terrestrial
interfaces, and quality of service management linked to
transport, which depends on the technology used for
transport over the terrestrial interfaces.

Quality of service management linked to radio access
20   is typical of code division multiple access (CDMA)
systems, for example the UMTS, and includes mechanisms
such as radio admission control, selection of appropriate
transport formats on transport channels, etc. The
exchanges of signaling defined in the application
25   protocols outlined hereinabove generally enable the
network elements concerned of the UTRAN to determine the
quality of service constraints necessary for executing
these quality of service management mechanisms linked to
radio access. The main network element of the UTRAN
30   affected by implementing quality of service management
mechanisms linked to radio access is the RNC, in its SRNC
role. This is because, on the basis of quality of
service parameters that are signaled to it by the core
network, using the RANAP protocol, the SRNC can decide
35   which type of service is required and therefore translate
the quality of service parameters into parameters that
may be used to set up radio links between Nodes B and

user equipments, if necessary via one or more DRNC, and then signal those parameters to the network elements concerned, namely the Node B, using the NBAP protocol, and the DRNC, using the RNSAP protocol.

5   Transport over the terrestrial interfaces is generally in packet mode to optimize the use of resources available for transmission over those interfaces. Packet mode was originally intended for non-real-time services (having no strict priority and/or time delay

10   constraints), and additional mechanisms, including quality of service management mechanisms, for example, were introduced subsequently to enable packet mode additionally to support real-time services (having strict priority and/or time delay constrains), for example voice

15   services. In the case of the UMTS for example, it is also necessary to introduce the real-time concept for packet services to deal with the "soft handover" problem, i.e. that of requiring the RNC to supply the sending times of the data to the various Nodes B controlling the

20   cells to which the mobile is connected. These sending times take the form of radio frame numbers, and thus limit the maximum delay authorized for the transmission of data between the RNC and the Node B. For reasons of efficient power control and radio admission control, for

25   example, the maximum delay cannot be set too high.

One transport technology used in the UTRAN is the asynchronous transfer mode (ATM) technology based on asynchronous time division multiplexing of small packets of fixed size known as cells. The ATM technology is

30   covered by standards and the corresponding standards published by the corresponding standards bodies may be consulted for more information. Suffice to say that an ATM network may be modeled by means of an ATM layer and an ATM adaptation layer (AAL) between the ATM layer and

35   users. The ATM layer is connection-oriented and transmits cells between a source and a destination over a logical connection also known as a virtual channel (VC).

For application of the ATM technology to transport within the UTRAN, a specific AAL layer called the AAL2 layer is used for user data. When a user equipment communicates with the UTRAN, a corresponding logical connection
5   (called an AAL2 connection) is set up over one or more of the terrestrial interfaces concerned of the UTRAN. In the case of the ATM technology, the mechanisms for managing the transport quality of service include, for example, connection admission control (to decide if the
10   transmission resources are sufficient to accept a new AAL2 connection request whilst maintaining the guaranteed quality of service), and scheduling (queuing) for multiplexing AAL2 connections within a virtual circuit, for example as a function of priority.
15   Technologies other than the ATM technology may be used in the transport network, for example the Internet Protocol (IP) technology. The IP technology is also covered by standards and the corresponding standards published by the corresponding standards bodies may be
20   consulted for more information. Once again, mechanisms for managing the transport quality of service may be provided in the case of the IP technology.
          The present invention relates more particularly to managing the quality of service linked to transport, and
25   even more particularly to mechanisms enabling the network elements concerned of the UTRAN to determine the quality of service constraints necessary for implementing quality of service management. In the absence of such knowledge, or in the event of insufficient knowledge, this quality
30   of service management cannot be implemented optimally and the quality of service may be degraded to an extent that users find unacceptable.
          On the basis of radio access bearer (RAB) parameters signaled to it by the core network using the RANAP
35   protocol, the SRNC can decide what type of service is required for a user equipment and therefore which quality of service should be used in the transport network to

transmit user data for that user equipment in the downlink direction over the Iub interface to the Node B (respectively over the Iur interface to the DRNC).

A problem nevertheless remains, that of the Node B (respectively the DRNC) knowing which quality of service should be used in the transport network to transmit user data for a user equipment in the uplink direction over the Iub interface (respectively in the uplink direction over the Iur interface and/or the downlink direction over the Iub interface).

A first solution to this problem is as follows. In the case of a transport network using the ATM technology, the signaling relating to the transport network layer includes the Access Link Control Application Part (ALCAP) protocol as defined in ITU-T Specifications Q.2360-1 and Q.2360-2 published by the International Telecommunications Union (ITU), for example, and corresponding to successive versions of the 3GPP standard, respectively version R99 (for the ITU-T specification Q.2360-1) and the versions R4 and subsequently R5 (for the ITU-T specification Q.2360-2). The ITU-T specification Q.2360-2 defines a quality of service parameter called the AAL type 2 requested type path that may take one of the following three values, as a function of the type of service: "stringent", "tolerant" and "stringent bi-level". This parameter is transmitted by the CRNC (respectively the SRNC) to the Node B (respectively the DRNC) and enables the Node B (respectively the DRNC) to determine, within limits defined by these values, the quality of service constraints applicable to uplink transmission of user data over the Iub interface (respectively uplink and downlink transmission over the Iur interface).

However, this first solution may be applied only from version R4 of the 3GPP standard. It is not applicable to the R99 version, or to the R5 version if the transport network uses the IP technology. For

example, in the current version of the standard, and in the case of a transport network using the IP technology, the signaling relating to the transport network layer is such that the Node B (respectively the DRNC) does not

5   know which quality of service should be used in the transport network for uplink transmission of user data over the Iub interface (respectively uplink transmission over the Iur interface and/or downlink transmission over the Iub interface). Also, the three values for the AAL

10   type requested type path parameter (see above) do not necessarily differentiate sufficiently between the available types of service, and therefore do not necessarily allow optimum implementation of the quality of service management mechanisms.

15   A second solution to the above problem is as follows. Under version R99 of the standard, failing a standardized solution, it would be possible to use a "proprietary" mechanism in the Node B (respectively the DRNC) to configure the transport priority for each type

20   of service over the Iub interface (respectively the Iur interface). For example, the Node B (respectively the DRNC) could, on the basis of parameters transmitted by the CRNC (respectively the SRNC) using the ALCAP protocol, determine which connections are associated with

25   voice services and assign them a high transport quality of service, and conversely assign a lower transport quality of service to connections associated with other types of service (for example web browsing, ftp, dedicated signaling, videotelephony, etc.).

30   However, this second solution may be applied only if the Node B (respectively the DRNC) and the CRNC (respectively the SRNC) are from the same manufacturer. It cannot be applied if those network elements are from different manufacturers.

35   The present invention adopts another approach to solving this problem. The present invention is based in particular on the following observations. Some quality

of service parameters, such as parameters representative
of the transfer delay and/or traffic handling priority,
as defined for example in the above-mentioned Technical
Specification 3GPP TS 23.107, are very important in

5   guaranteeing the quality of service, for example the
transport quality of service, within this kind of
network. Now, parameters of this kind are already used
for quality of service management linked to radio access.
However, under the current version of the standard, and

10   as outlined above, for managing the quality of service
linked to radio access, knowledge of these quality of
service parameters remains essentially localized to the
SRNC. This is because, as mentioned above, on the basis
of radio access bearer (RAB) parameters that are signaled

15   to it by the core network (using the RANAP protocol), the
SRNC can determine which type of service is required for
a user equipment. The SRNC can then translate those
parameters into parameters that may be used to set up
radio links between the Node B and the user equipment, if

20   necessary via one or more DRNC, and then signal those
parameters to the network elements concerned, namely the
Node B, using the NBAP protocol, and the DRNC, using the
RNSAP protocol. These parameters include, for setting up
radio links between Nodes B and user equipments,

25   parameters such as transport format combination set
(TFCS) or transport format parameters, and, if needed for
multiplexing by the DRNC on common or shared transport
channels, parameters such as traffic class and traffic
handling priority.

30   However, under the current version of the standard,
such signaling of transport format parameters generally
cannot indicate quality of service constraints for the
transport network layer, and such signaling of the
traffic class and the traffic handling priority is

35   effected only at the Iur interface (and not at the Iub
interface), and only in the case of common or shared
transport channels (and not in the case of dedicated

channels). Also, this kind of signaling cannot indicate the quality of service constraints for the transport network layer, at least in terms of transfer delay. In particular, in distinguishing between different conversational class services, it does not allow a distinction to be made between services that require a short transfer delay (for example telephone services) and services that may tolerate longer transfer delays (for example videophone services).

A particular object of the present invention is to solve some or all of the above-mentioned problems and/or to avoid some or all of the above-mentioned drawbacks. Another object of the present invention is to propose different mechanisms to allow the network elements concerned of the UTRAN to determine the transport quality of service constraints needed to manage the quality of service. A more general object of the present invention is to improve and/or to simplify quality of service management in these systems.

One aspect of the present invention consists in a method of managing quality of service in a mobile radio network in which protocols for communication over terrestrial interfaces comprise a radio network layer and a transport network layer and quality of service management includes quality of service management linked to the radio network layer and quality of service management linked to the transport network layer, said method comprising:

- a step in which a first network element signals to a second network element by means of the radio network layer signaling protocol at least one parameter representative of transport quality of service or of quality of service for the transport network layer, and

- a step in which the second network element uses said at least one parameter for transport quality of service management.

According to another feature, said first network

element is a controlling radio network controller.

According to another feature, said second network element is a Node B or a base station.

According to another feature, said radio network layer signaling protocol is a Node B Application Part protocol applicable to the Iub interface between the controlling radio network controller and the Node B.

According to another feature, said second network element uses said at least one parameter for transport quality of service management for uplink transmission over the Iub interface between the controlling radio network controller and the Node B.

According to another feature, said first network element is a serving radio network controller.

According to another feature, said second network element is a drift radio network controller.

According to another feature, said radio network layer signaling protocol is a radio network subsystem application part signaling protocol applicable to the Iur interface between the serving radio network controller and the drift radio network controller.

According to another feature, said second network element uses said at least one transport quality of service management parameter for uplink transmission over the Iur interface between the serving radio network controller and the drift radio network controller and/or downlink transmission over the Iub interface between the drift radio network controller and the Node B.

According to another feature, said at least one parameter representative of transport quality of service is a specific parameter intended to indicate a transport quality of service level.

According to another feature, said at least one parameter representative of transport quality of service is at least one radio access bearer parameter that may also be used as a transport quality of service parameter.

According to another feature, said at least one

radio access bearer parameter that may also be used as a transport quality of service parameter is the transfer delay.

According to another feature, said at least one radio access bearer parameter that may also be used as a transport quality of service parameter is the traffic handling priority.

According to another feature, said at least one radio access bearer parameter that may also be used as a transport quality of service parameter is the traffic class.

According to another feature, said at least one radio access bearer parameter that may also be used as a transport quality of service parameter is copied or translated from the RANAP protocol to the NBAP protocol, respectively from the RANAP protocol to the RNSAP protocol.

According to another feature, said at least one parameter representative of transport quality of service is at least one parameter that may be associated with a transport quality of service level or at least one radio access bearer parameter that may also be used as a transport quality of service parameter.

According to another feature, said at least one parameter that may be associated with a transport quality of service level or at least one radio access bearer parameter that may also be used as a transport quality of service parameter is a time adjustment parameter, the lowest values of said parameter being assigned to connections having the highest transfer delay and/or traffic handling priority constraints, and the highest values of said parameter being assigned to connections having the highest transfer delay and/or traffic handling priority constraints.

According to another feature, said time adjustment parameter is the time of arrival window start parameter.

According to another feature, said at least one

parameter that may be associated with a level of
transport quality of service or at least one radio access
bearer parameter that may also be used as a transport
quality of service parameter includes at least one
5   parameter representative of the number of dedicated
channels allocated to a connection, a high number of
dedicated channels being allocated to connections having
high transfer delay and/or traffic handling priority
constraints, and a lower number of dedicated channels
10   being allocated to connections having lower transfer
delay and/or traffic handling priority constraints.

The present invention also consists in a network
element comprising means for implementing the above
method.
15   According to another feature, said network element
is a controlling radio network controller.

According to another feature, said network element
is a serving radio network controller.

According to another feature, said network element
20   is a drift radio network controller.

According to another feature, said network element
is a Node B.

Other objects and features of the present invention
will become apparent on reading the following description
25   of one embodiment, given with reference to the appended
drawings, in which:
- Figure 1, described above, shows the general
architecture of a mobile radio system such as the
UMTS for example, and
30   - Figures 2 and 3, described above, show the CRNC,
SRNC, and DRNC roles of an RNC.

Different embodiments of the present invention are
described hereinafter.

In a first embodiment, one or more new parameters
35   may be introduced into one or more signaling messages
sent from the CRNC to the Node B using the NBAP protocol
(respectively from the SRNC to the DRNC using the RNSAP

protocol). By means of the new parameter(s), the CRNC (respectively the SRNC) is able to assign a high level of transport quality of service to certain types of service (for example types of service having high delay and/or

5 priority constraints) and a lower transport quality of service level to other types of service (for example types of service having less strict delay and/or priority constraints). For example, a high level of transport quality of service may be assigned to voice services and

10 a lower transport quality of service level may be assigned to other types of service. Intermediate quality of service levels may also be provided, in sufficient numbers to allow sufficient differentiation of types of service and thus optimum quality of service management.

15 For example, the new parameter(s) may be transmitted in a message such as the "Radio Link Setup Request" message sent from the CRNC to the Node B using the NBAP protocol (respectively from the SRNC to the DRNC using the RNSAP protocol).

20   In a second embodiment, one or more new parameters for indicating transport quality of service parameter values for each type of service may be introduced into one or more signaling messages sent from the CRNC to the Node B using the NBAP protocol (respectively from the

25 SRNC to the DRNC using the RNSAP protocol). The new parameter(s) may be derived from the radio access bearer (RAB) parameters sent to the SRNC using the RANAP protocol, for example. The RANAP protocol includes sending the following RAB parameters from the core

30 network to the SRNC:
        - traffic class,
        - transfer delay for conversational or streaming class services, and
        - traffic handling priority for interactive class

35 services.
       For example, the new parameter(s) may correspond to one or more traffic class, transfer delay, and traffic

handling priority parameters which may then be copied (or translated) from the RANAP protocol to the NBAP protocol, or one or more transfer delay and traffic handling priority parameters, which may then be copied (or
5   translated) from the RANAP protocol to the RNSAP protocol (the traffic class parameter having already been copied from the RANAP protocol to the RNSAP protocol).

      For example, the new parameter(s) may be sent in a message such as the "Radio Link Setup Request" message
10   sent from the CRNC to the Node B using the NBAP protocol (respectively from the SRNC to the DRNC using the RNSAP protocol).

      In a third embodiment, one or more existing parameters communicated to the Node B (respectively the
15   DRNC) using the NBAP protocol (respectively the RNSAP protocol) may be used by the Node B (respectively the DRNC) to assign a high level of transport quality of service to certain types of service (for example types of service having strict delay and/or priority constraints)
20   and a lower level of transport quality of service to other types of service (for example types of service having less strict delay and/or priority constraints).

      A first example of these existing parameters is the time of arrival window start (TOAWS) parameter defined in
25   the Technical Specification 3GPP TS 25.402, for example. Remember that dedicated frame protocols, as defined in the Technical Specifications 3GPP TS 25.425, 3GPP TS 25.427 and 3GPP TS 25.435, for example, are used for the transfer of user data over the terrestrial interfaces.
30   Those protocols provide a data structure in accordance with a frame format and time adjustment and synchronization functions involving the TOAWS parameter, for example. To be more precise, a reception window is defined within which the time of arrival at the Node B of
35   a frame sent by the RNC should occur. This window is defined by a time of arrival window start (TOAWS) defined relative to a time of arrival window end (TOAWE) in turn

defined relative to a latest time of arrival (LTOA). If
the time of arrival of a frame is before the TOAWS or
after the TOAWE, then the Node B requests a time
adjustment from the RNC. The object is to ensure that
5   the Node B receives frames within a time appropriate for
their retransmission at predetermined times over the
radio interface, i.e. soon enough to be able to carry out
the necessary processing before such retransmission, but
not too soon, to avoid waiting times. A reception window
10   of this kind is configured in the Node B when each radio
link is set up; TOAWE and TOAWS values are therefore
signaled by the CRNC (respectively the SRNC) to the Node
B (respectively the DRNC) in different messages using the
NBAP protocol (respectively the RNSAP protocol), such as
15   the "Radio Link Setup Request" message for example.
        According to one aspect of the invention, the CRNC
(respectively the SRNC) may therefore assign the lowest
TOAWS values to connections having a higher level of
transport quality of service, for example, and the Node B
20   (respectively the DRNC) may then use those TOAWS values
for transport quality of service management. In other
words, a time adjustment parameter such as the TOAWS
parameter may be considered representative of transport
quality of service in that it may be associated with a
25   transport quality of service level or with at least one
RAB parameter that may itself be used as a transport
quality of service parameter. The CRNC (respectively the
SRNC) may for example assign a TOAWS value of 10 ms to
connections having a high level of transport quality of
30   service (such as connections for voice services, for
example), or a higher TOAWS value to connections having a
lower level of transport quality of service, and signal
that value to the Node B (respectively the DRNC), for
example in the NBAP (respectively the RNSAP) "Radio Link
35   Set Up Request" message. The Node B (respectively the
DRNC) then assigns a high level of transport quality of
service to connections having the lowest TOAWS values or

a lower level of transport quality of service to connections having higher TOAWS values.

A second example of an existing parameter is the number of dedicated channels (DCH) assigned to a connection. As is known in the art, the CRNC (respectively the SRNC) may assign a plurality of dedicated channels to connections having a high level of transport quality of service (such as connections for voice services, for example) or a single dedicated channel to connections for other types of service having a lower level of transport quality of service. For example, for speech using adaptive multi-rate (AMR) coding, three different transport channels are generally used, one for class A bits, one for class B bits and one for class C bits, where the three classes of bits correspond to different levels of importance of the bits. See also, for example, the Technical Specification 3GPP TS 34.108. The CRNC (respectively the SRNC) may then signal the number of dedicated channels to the Node B (respectively the DRNC), for example in the NBAP (respectively the RNSAP) "Radio Link Setup Request" message.

According to one aspect of the invention, the Node B (respectively the DRNC) may then assign a high level of transport quality of service to connections such as connections for voice services assigned three dedicated channels or a lower level of transport quality of service to connections to which only one dedicated channel is assigned, for example. In other words, a parameter such as the number of dedicated channels assigned to a connection may also be considered representative of transport quality of service, in that it may be associated with a level of transport quality of service or at least one RAB parameter that may itself be used as a transport quality of service parameter.

To give another example, the SRNC may:

- assign the conversational traffic class and

allocate three dedicated channels to connections
for voice services,

- assign the conversational traffic class and
allocate a single dedicated channel to connections
for other types of conversational class services
(for example videophone services),

- assign other traffic classes to other connections,
and signal those parameters to the DRNC, for example, in
a "Radio Link Setup Request" message, for example. The
DRNC may then assign a high level of transport quality of
service to conversational class connections to which
three dedicated channels have been assigned and lower
levels of transport quality of service to other
connections.

Common to all the above embodiments is the feature
that each time the CRNC (respectively the SRNC) sets up a
radio link associated with a type of service having high
delay and/or priority constraints, it signals to the
Node B (respectively the DRNC), using the NBAP protocol
(respectively the RNSAP protocol), the fact that the
transport connection associated with that particular
radio link has a high level of transport quality of
service (for example high delay and/or priority
constraints). Conversely, each time that the CRNC
(respectively the SRNC) sets up a radio link associated
with a type of service having a lower level of transport
quality of service (for example lower delay and/or
priority constraints), it signals to the Node B
(respectively the DRNC) using the NBAP protocol
(respectively RNSAP protocol) the fact that the transport
connection associated with that particular radio link has
a lower level of transport quality of service (for
example lower delay and/or priority constraints).

Using this information, the Node B (respectively the
DRNC) may then implement transport quality of service
management mechanisms in the uplink direction over the
Iub interface (respectively the uplink direction over the

Iur interface and/or the downlink direction over the Iub
interface), to satisfy the transport quality of service
constraints indicated by the CRNC (respectively the
SRNC), for example delay and/or priority constraints.

5   This enables delay constraints for voice services to be
satisfied, for example.

The present invention also consists in a network
element (for example a CRNC, a SRNC, a DRNC or a Node B)
including means for implementing a method of the

10   invention.

Since the particular implementation of such means do
not represent any particular problem for the person
skilled in the art, such means need not be described here
in greater detail than by describing their function, as

15   described above.